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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,181	11/18/2003	James P. Nadeau	F132	3804

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EXAMINER	
MCDONALD, RODNEY GLENN	

ART UNIT	PAPER NUMBER
1753	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,181	NADEAU ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) *40 and 41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/04, 6/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I in the reply filed on June 29, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

Claims 1-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 4, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 2, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 3, line 2, is indefinite because "slightly" is a relative term that lacks basis for comparison.

Claim 4, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 5, line 2, is indefinite because "slightly" is a relative term that lacks basis for comparison.

Claim 9, line 4, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 10, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 12, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 15, line 4, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 16, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 17, line 2, is indefinite because "slightly" is a relative term that lacks basis for comparison.

Claim 18, line 2, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 19, line 2, is indefinite because ""slightly" is a relative term that lacks basis for comparison.

Claim 26, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 27, line 3, is indefinite because "slightly" is a relative term that lacks basis for comparison.

Claim 28, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 29, line 3, is indefinite because ""slightly" is a relative term that lacks basis for comparison.

Claim 30, line 4, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 31, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 32, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 34, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim 35, line 3, is indefinite because "closely" is a relative term that lacks basis for comparison.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Tao et al. (U.S. Pat. 5,874,010).

Regarding claim 1, Tao et al. teach a method of exposing a planar cross-section of a structure composed of a first material. (Fig. 1c, Fig. 1d) The method comprises depositing a layer of a second material on the structure. The second material having mill rates at a higher incidence angles that closely approximate the mill rates of the first material at those incidence angles. (Column 3 lines 66-67; Column 4 lines 1-7; Column

4 lines 37-64) An ion beam is directed at the structure. (Column 4 lines 20-36) Milling the structure in order to expose a cross-section of the structure thereby producing a uniformly planar face on the exposed cross-section. (Column 4 lines 20-36; Column 5 lines 1-19)

Regarding claim 4, the tungsten would have mill rates at incidence angles greater than 45 degrees that closely approximate the mill rates of the first material at incidence angles greater than 45 degrees. (Column 4 lines 37-64)

Regarding claim 5, the tungsten would have mill rates at incidence angles greater than 45 degrees that are equal to or slightly greater than the mill rates of the first material at incidence angles greater than 45 degrees. (Column 4 lines 37-64)

Regarding claim 6, the structure comprises a write-head for a magnetic disk system. (See Abstract)

Regarding claim 7, the first material comprises an alloy of Ni and Fe. (Column 3 lines 36-37)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 3, 8-14 and 24-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tao et al. (U.S. Pat. 5,874,010) in view of Hong et al. (U.S. Pat 6,198,608).

Tao et al. is discussed above and all is as applies above. (See Tao et al. discussed above)

The differences between Tao et al. and the present claims is that the second material having a mill rate at incidence angles greater than 75 degrees that closely approximate the mill rates of the first material at incidence angles greater than 75 degrees is not discussed (Claims 2, 10), that the second material having a mill rate at incidence angles greater than 75 degrees that are equal to or slightly greater than mill rates of the first material at incidence angles greater than 75 degrees (Claims 3, 11), the second material being carbon is not discussed (Claims 8, 14), producing a non-planar face is not discussed (Claims 9, 14) and the determination steps are not discussed (Claims 24-38).

Regarding claims 2, 3, 8, 10, 11, Hong et al. teach that the second material can comprise carbon. (Column 5 lines 28-37)

Regarding claims 9, 14, since Tao et al. teach utilizing different materials selection of the different materials with the different etching rates would result in a non-planar cross-sectional face. (See Tao et al. discussed above)

Regarding claim 12, Tao et al. already discuss the tungsten would have mill rates at incidence angles greater than 45 degrees that closely approximate the mill rates of the first material at incidence angles greater than 45 degrees. (Column 4 lines 37-64)

Regarding claim 13, Tao et al. already discuss the tungsten would have mill rates at incidence angles greater than 45 degrees that are equal to or slightly greater than the mill rates of the first material at incidence angles greater than 45 degrees. (Column 4 lines 37-64)

The motivation for utilizing the features of Hong et al. is that it allows for utilizing a low milling rate material. (Column 4 lines 62-65)

Regarding claims 24-38, Tao et al. and Hong et al. discuss the steps except for the determining steps. However, by selection of the layers in Tao et al. one determines what layers to select and each layer has it's own etching characteristics. (See Tao et al. and Hong et al. discussed above; Tao et al. Table)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the features of Tao et al. by utilizing the features of Hong et al. because it allows utilizing a low milling rate material.

Claims 15-23 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tao et al. in view of Hong et al. and further in view of Tasker et al. (U.S. Pat. 6,889,113).

Regarding claim 15, Tao et al. is discussed above and teach a first material (i.e. NiFe) with a second material (i.e. refractory metals) deposited on the first material. The second material has a mill rate at higher incidence angles that closely approximate the mill rates of the first material at those incident angles. Tao et al. teach directing an ion beam at the structure in order to expose a planar cross-section of the structure and the layer of second material. (See Tao et al. discussed above)

Regarding claims 17, 19, the tungsten of Tao et al. would have mill rates at incidence angles greater than 45 degrees that are equal to or slightly greater than the mill rates of the first material at incidence angles greater than 45 degrees. (Tao et al. Column 4 lines 37-64)

Regarding claims 18, the tungsten of Tao et al. would have mill rates at incidence angles greater than 45 degrees that closely approximate the mill rates of the first material at incidence angles greater than 45 degrees. (Tao et al. Column 4 lines 37-64)

Regarding claim 20, Tao et al. teach the first material comprises an alloy of Ni and Fe. (Column 3 lines 36-37)

The differences not yet discussed is directing an electron beam at the planar cross section, determining the edge positions for the desired dimensions of the cross section and determining the distance between the edge positions (Claim 15), the second material having a mill rate at incidence angles greater than 75 degrees that closely approximate the mill rates of the first material at incidence angles greater than 75 degrees is not discussed (Claim 16), the second material comprising carbon is not discussed (Claims 21, 39), utilizing focused ion beam milling is not discussed (Claim

22), determining the edge positions on a cross-section comprising forming an image of the cross-section on an image forming device and applying an algorithm to assign an edge position based upon grey-level variations (Claim 23) and directing a charged particle beam at the structure in order to expose a planar cross-section, directing an electron beam at the cross-section and measuring the width of the structure cross-section is not discussed (Claim 39).

Regarding directing an electron beam at the planar cross section, determining the edge positions for the desired dimensions of the cross section and determining the distance between the edge positions (Claim 15), Tasker et al. teach directing an electron beam at the planar cross section. (Tasker et al. Column 3 lines 59-62; Column 4 lines 7-9) Determining the edge positions for the desired dimensions of the cross section. (Tasker et al. Column 4 lines 17-18) Determining the distance the distance between the edge positions. (Tasker et al. Column 4 lines 21-23)

Regarding claims 16, 21, 39, Hong et al. teach that the second material can comprise carbon. (Hong et al. Column 5 lines 28-37)

Regarding claim 22, Tasker et al. teach utilizing focused ion beam milling to expose a cross section. (Tasker et al. Column 4 line 9)

Regarding claim 23, Tasker et al. teach determining the edge positions on a cross-section comprising forming an image of the cross-section on an image forming device and applying an algorithm to assign an edge position based upon grey-level variations. (Tasker et al. Column 3 lines 36-38; Column 4 lines 6-39)

Regarding claim 39, Tasker et al. teach ion beam milling to expose a cross section. (Tasker et al. Column 3 lines 59-62) Directing an electron beam at the cross-section. (Tasker et al. Column 4 lines 7-10) Measuring the width of the structure. (Tasker et al. Column 1 lines 39-40)

The motivation for utilizing the features of Tasker et al. is that it allows for measuring feature shape. (See Tasker et al. Abstract)

The motivation for utilizing the features of Hong et al. is that it allows for utilizing a low rate etching material. (See Hong et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tao et al. by utilizing the features of Hong et al. and Tasker et al. because it allows for measuring feature shape and for providing a low rate etch material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-TH with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
September 11, 2007